

AD 系列按钮开关指示灯
AD Series Pushbutton switches

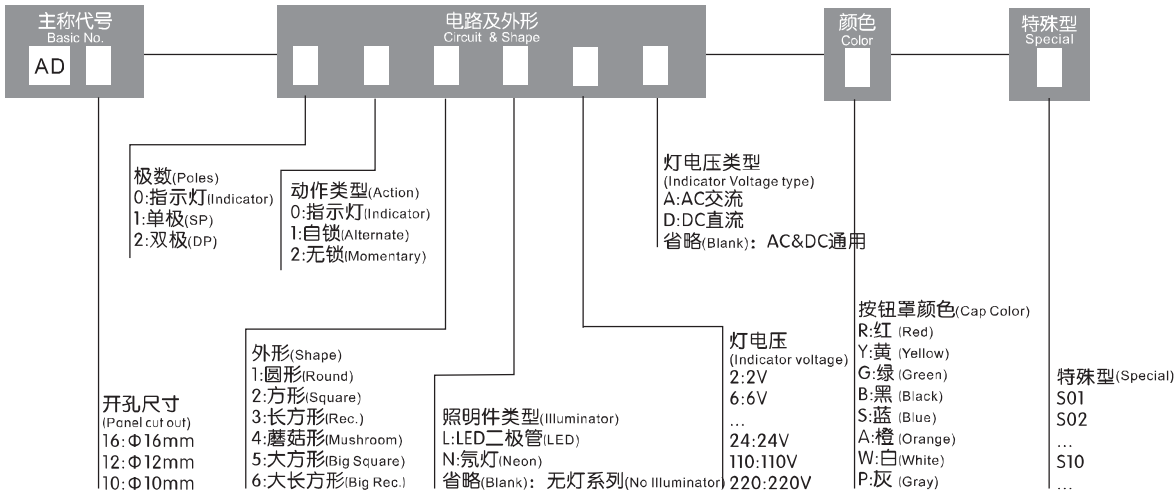
YONG XING
ELECTRONIC



技术性能参数 SPECIFICATION

电气额定值 (阻性负载) Max. Rating Current & Voltage(Resistive Load)	3A 250V AC
接触电阻 (初始值) Contact Resistance	≤50mΩ
绝缘电阻 (常态) Insulation Resistance	≥1,000MΩ
耐压 (常态) Dielectric Strength	1,500V
电气寿命 (次) Electronic Life(cycles)	无锁:50,000 自锁:25,000 Momentary:50,000 Alternate:25,000
机械寿命 (次) Mechanical Life(cycles)	无锁:200,000 自锁:50,000 Momentary:200,000 Alternate:50,000
工作环境温度 Operating temperature	-5℃~+75℃
防护等级 IP code	IP40

型号命名规则 HOW TO ORDER



举例 (Example): 开关型号 (Switch Type): AD16-111L2D-R
指示灯型号 (Indicator type): AD16-001L6D-R

照明件性能指标 Lighting pieces of performance indicators

■ 电子发光二极管(LED)

工作电压 Operating voltage	2V	6V	12V	24V	110V	220V	寿命 Life	等效电路 Equivalent circuit
工作电流 Current	小于15mA Less than 15mA				小于5mA Less than 5mA		约5万小时(但亮度会随使用时间加长而衰减) About 50,000 hours (but the brightness will be weaken as the life of using plus.)	
LED颜色 LED color	红 绿 黄 橙 蓝 Red Green Blue Yellow Orange							
按钮罩颜色 Cap Color	红 绿 黄 橙 蓝 黑 白 灰 Red Green Blue Yellow Orange Black White Gray							

■ 氖灯管(Neon)

工作电压 Operating voltage	110V AC	220V AC
工作电流 Current	小于1mA Less than 1mA	小于1mA Less than 1mA
氖灯颜色 Neon color	红 绿 Red Green	
按钮罩颜色 Cap Color	红 绿 Red Green	





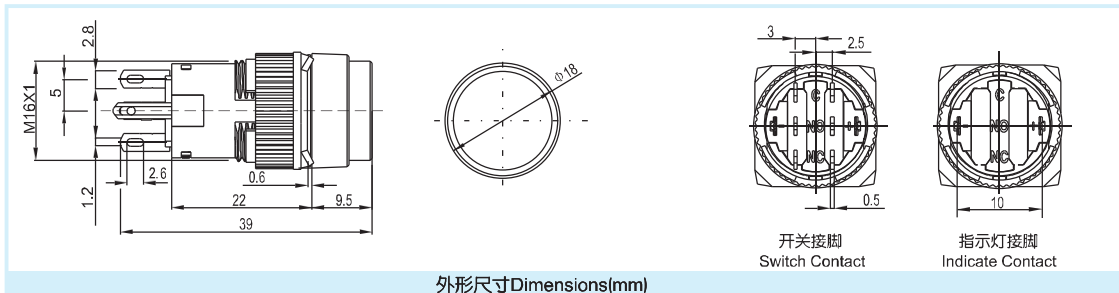
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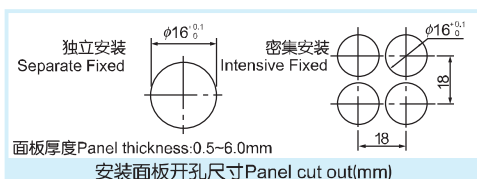
Φ16外形及尺寸图Overall & Dimensions(mm)



圆形
Round

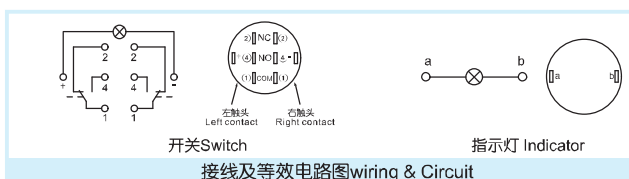


外形尺寸Dimensions(mm)



面板厚度Panel thickness:0.5~6.0mm

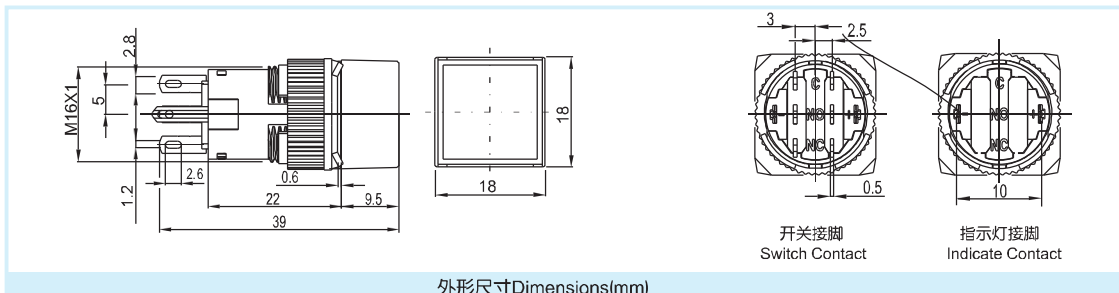
安装面板开孔尺寸Panel cut out(mm)



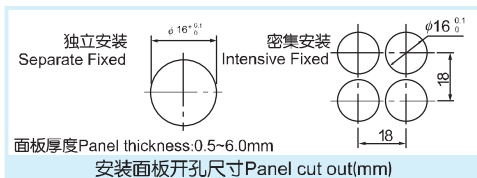
接线及等效电路图wiring & Circuit



方形
Square

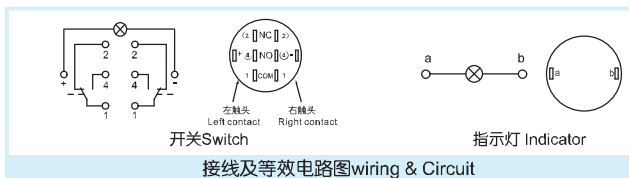


外形尺寸Dimensions(mm)



面板厚度Panel thickness:0.5~6.0mm

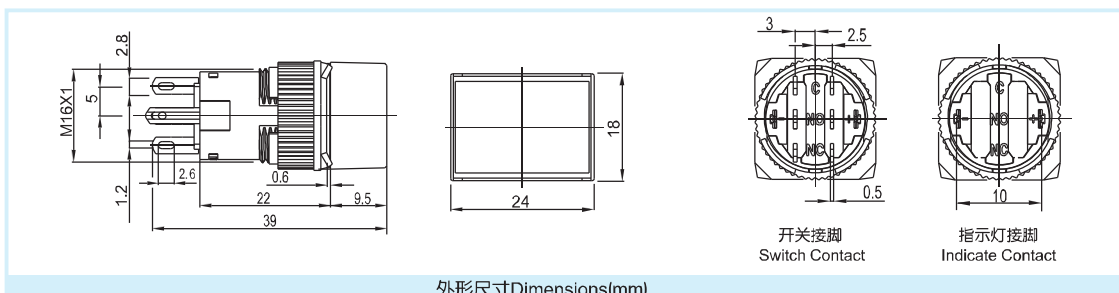
安装面板开孔尺寸Panel cut out(mm)



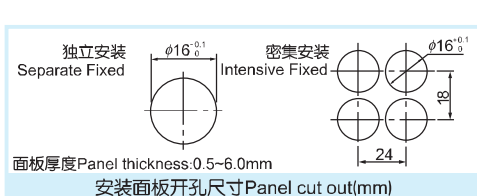
接线及等效电路图wiring & Circuit



长方形
Rec.

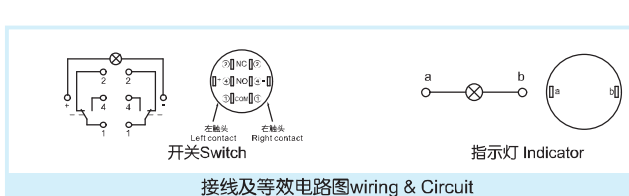


外形尺寸Dimensions(mm)



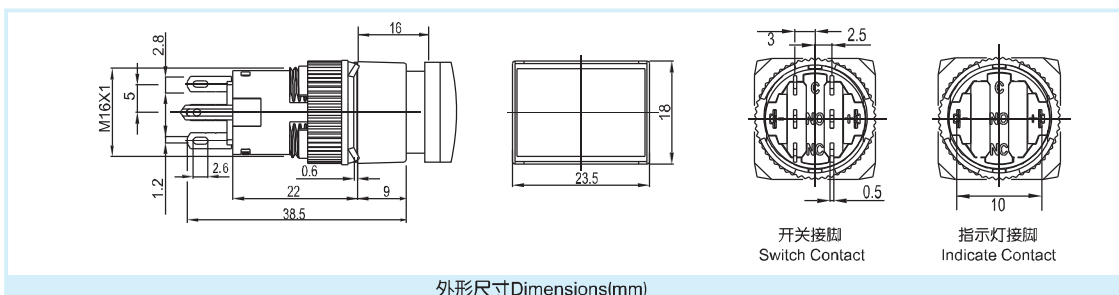
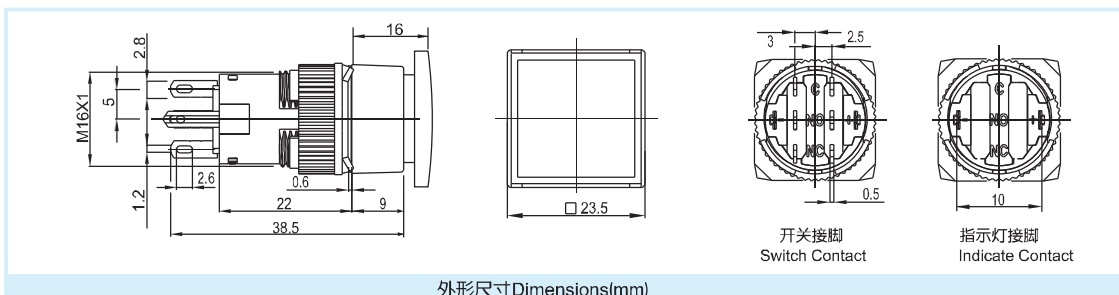
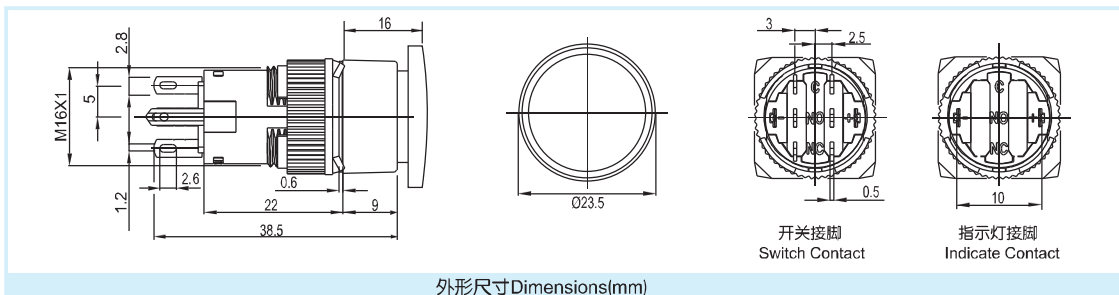
面板厚度Panel thickness:0.5~6.0mm

安装面板开孔尺寸Panel cut out(mm)



接线及等效电路图wiring & Circuit

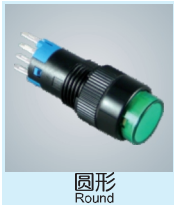
Φ16外形及尺寸图Overall & Dimensions(mm)



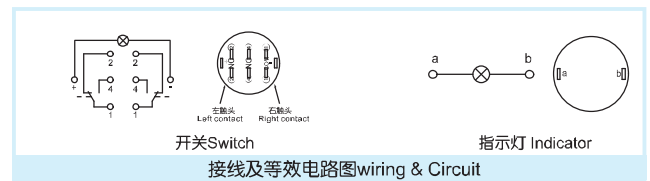
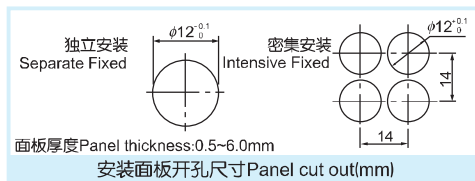
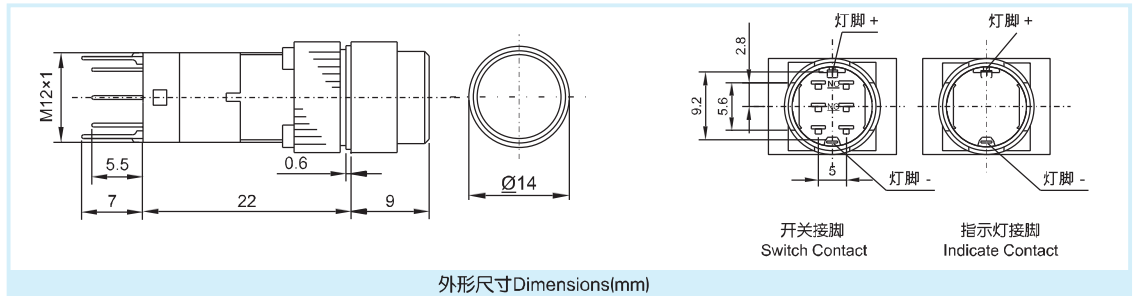


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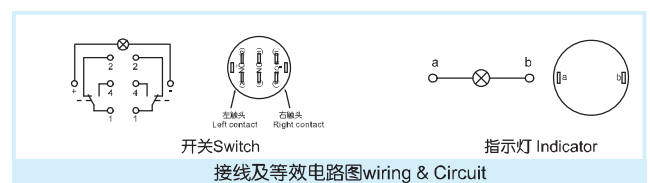
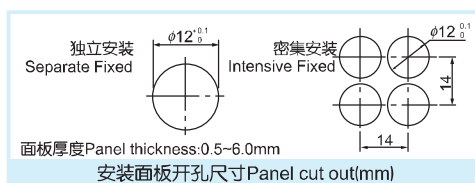
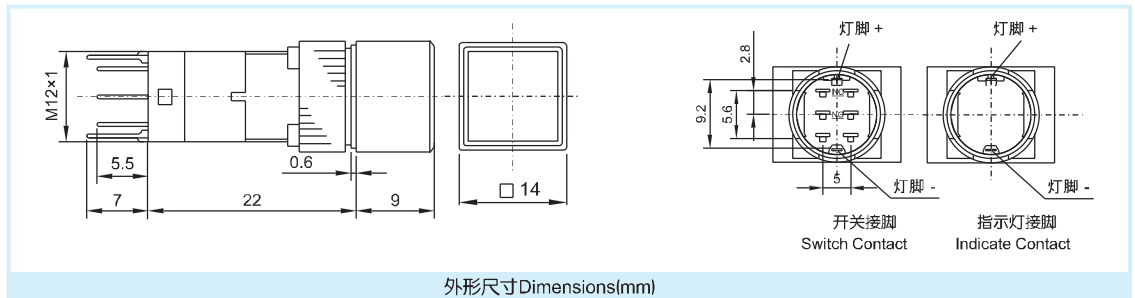
Φ12外形及尺寸图Overall & Dimensions(mm)



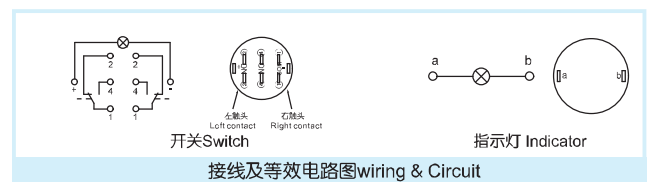
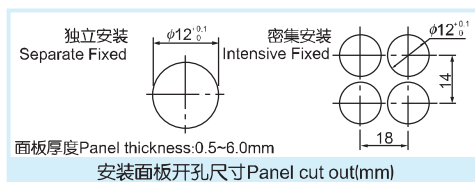
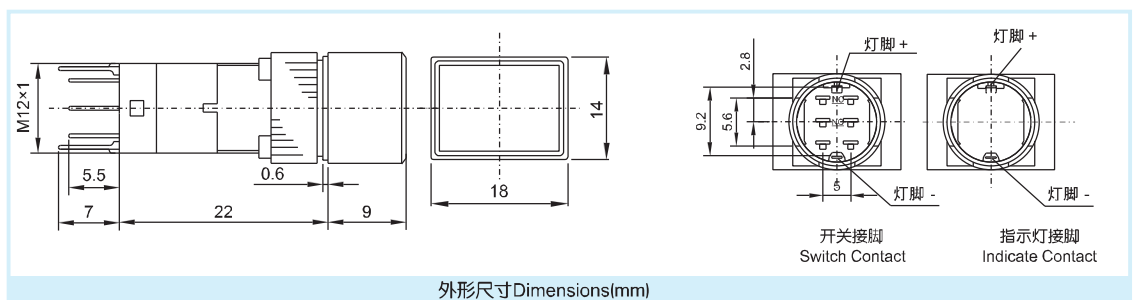
圆形
Round



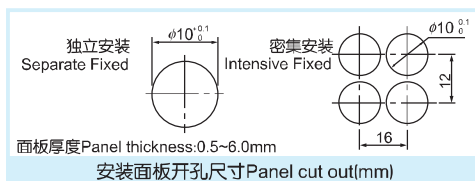
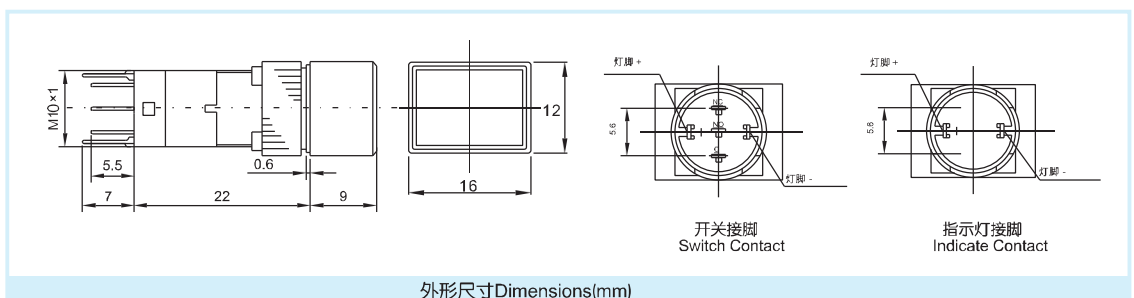
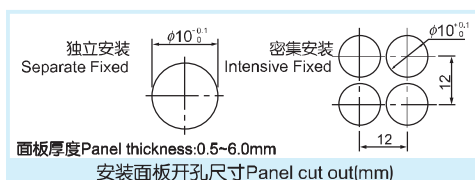
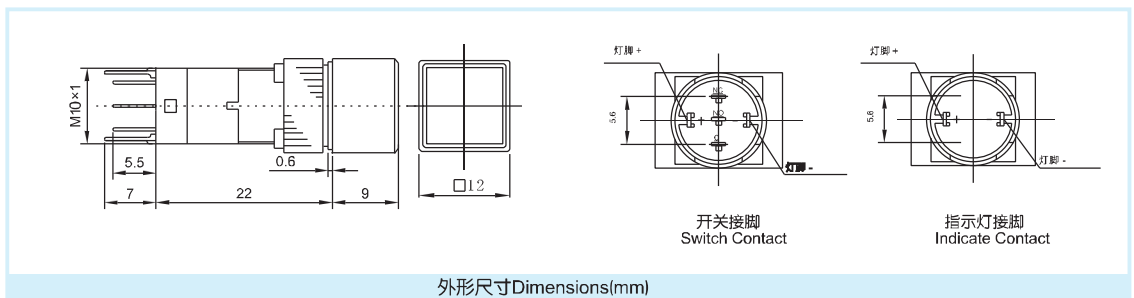
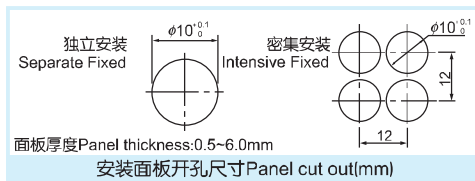
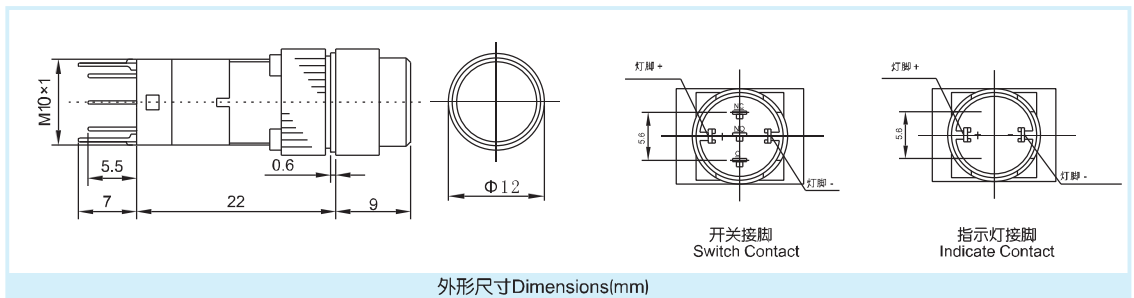
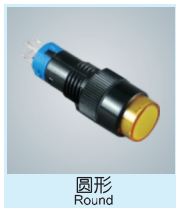
方形
Square



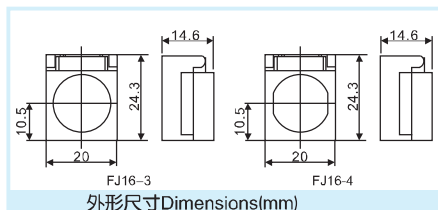
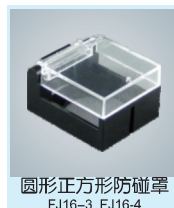
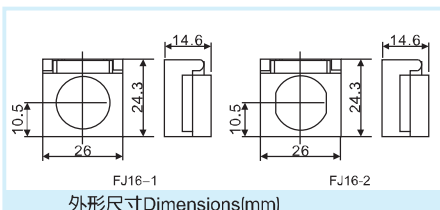
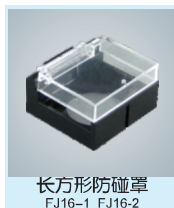
长方形
Rec.



Φ10外形及尺寸图Overall & Dimensions(mm)



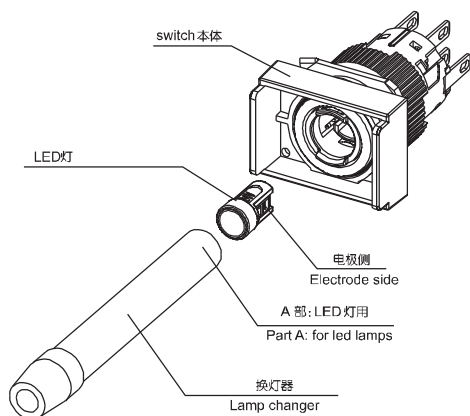
Φ 16 附件 Attachment



使用说明及注意事项 – Note and using Method –

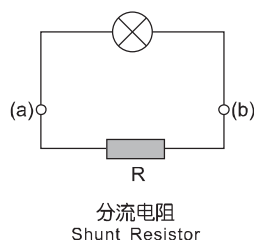
■ 灯泡的更换 Method of replacing lamp

- 将换灯器套在LED灯上，往外拔出灯泡。
安装时，将LED灯的电极侧对准本体的灯泡端子侧，并用手或者换灯器的前端将其轻轻固定后插入即可。
- To remove the LED lamp, insert the lamp change in the LED lamp and pull out the LED lamp. To mount the LED lamp, align the lamp terminal side of the main unit with the electrode side of the LED lamp, lightly hold the lamp by hand or with the head of the lamp changer, and insert the lamp. The LED lamp has no polarity, so it can be powered by either AC or DC
- LED灯的使用注意事项
发光颜色为绿色、蓝色的产品对静电非常敏感，使用时须特别小心谨慎，并请采取周全的防静电措施和防冲击电流措施。推荐采用下述防静电措施。
- Handling of LEDs
LED whose luminous color is green or blue is sensitive to static electricity. Be careful when handling the LED. Take thorough measures against static electricity and surges when handling the product. The following anti-electrostatic measure is recommended. Use a wristband or anti-electrostatic glove when replacing LED lamps.



■ LED

- LED的误点亮
LED灯配备有防误点亮电路，与旧产品相比，抗误点亮性能较强，当并非完全可靠。
LED灯只需微弱的电流(约0.25mA)便可点亮，由于电涌吸收电路及无触点电路产生的漏电流，或电缆间的分布电容等均可导致误点亮。此时，需要采取安装与LED灯并联的电阻等措施。
- 解决误亮灯的措施
在LED灯端子间并联分流电阻R能防止误亮灯。但电阻值应根据产品种类及使用条件而定。



■ 接线 Wiring

- 焊接作业应注意下述几点。
- 焊料的种类: 应使用松香芯焊锡丝
- 焊接作业请使用30W以下(350℃)的电烙铁，并在5秒钟内完成。并且，进行焊接作业时，应注意勿使端子承受张力。也勿使端子变形。
- 无铅焊料的熔点稍高，有时不易焊接。这时，请使用头部较大或者热量较大的电烙铁。
- 可连接的电线

单芯线	最大 φ	0.8	2根	} 焊接
绞合线	最大	0.75mm ²	1根	
- 关于接头的使用
使用同一接头的NO、NC接头时，应避免与不同电位以及异种电源的连接。
- 使用相邻的端子时，为了防止短路等事故，应使用绝缘套管以确保绝缘。当焊接端子处连接较粗电线、焊料比较多时，更需注意。
- Wiring to tab terminal
Use 110 (2.8mm) series receptacles for tab terminals.
- Pay attention to the following points when soldering.
Type of solder: Use resin-core solder.
Use a soldering iron with a maximum power consumption of 30W (300 °C) within five seconds. Make sure that the terminal is free of tension during soldering. Also, do not deform the terminal.
- The melting point of lead-free solder is slightly high, which may make soldering difficult. Use a soldering iron that has a large soldering tip or high heat generation.
- Connectable wires
Two solid wires with a maximum diameter of 0.8 mm (solder) One stranded wire with a maximum area of 0.75 mm² (solder) Flat-type connection terminal (2.8 -1.25-5) 0.5 to 1.25mm² (2.8 -0.5-5) 0.2 to 0.5mm²
- Use of contact blocks
When using NO and NC contacts in the same contact block, avoid connection that involves opposite polarity or wiring from different types of power supply.
- For wiring to adjacent terminals, use the terminal cover to prevent short-circuit, or an insulation tube to assure isolation. For solder terminals, caution is required if thick wires, in particular, are connected or a large quantity of solder is used.

● LED lamp malfunctioning (incorrect lighting)

The LED lamp incorporates a circuit to prevent malfunctioning. Compared with conventional models, this LED lamp is less likely to malfunction, but it incorporates no absolute countermeasures. A minute current (approximately 0.25 mA) turns on the LED lamp. A leakage current from the surge absorption circuit or noncontact circuit, or stray capacitance between cables, may also turn on the LED lamp. In this case, a countermeasure (e.g., attaching a resistor in parallel with the LED lamp) is required.

● Countermeasure against malfunctioning

Malfunctioning can be prevented by connecting a shunt resistor R in parallel. The resistance in that case varies with the model and operating conditions.

使用说明及注意事项 –Note and using Method–

●额定工作电压的范围，6V的产品为±5%，12V、24V的产品为±10%。并且，当时在+5%或者+10%的条件下使用时，选择的外部电阻值应保证所流过的电流小于额定电流，并将其与LED灯串联连接。

●The permissible fluctuation range for the operating voltage of the 6V model is ±5% and that for the 12V or 24V model is ±10%. If the operating voltage is always 5% or 10% higher, select a resistor that will make the operating current the same as or lower than the rated current, and connect the resistor in series to the LED lamp.

●外部电阻值的计算

(例)24V的LED(发光颜色: 红色)连接在48V的电路中时……

$$\begin{aligned} \text{外部电阻} [\Omega] &= \frac{\text{电路电压[V]} - \text{额定电压[V]}}{\text{额定电流[A]}} \\ &= \frac{48 - 24}{3 \times 10^{-3}} = 8000[\Omega] \end{aligned}$$

⇒ 因此，应使用8kΩ1W的电阻。
(电阻器容量的选择应留有充分的裕量。)

●Calculation of external resistance

Example: Connecting a 24V red LED to a 48V circuit

$$\begin{aligned} \text{External resistance} [\Omega] &= \frac{\text{Circuit voltage [V]} - \text{Rated voltage [V]}}{\text{Rated current[A]}} \\ &= \frac{48-24}{3 \times 10^{-3}} = 8000[\Omega] \end{aligned}$$

⇒ Therefore, use an external resistor of 8kΩ 1W.
(Select a resistor with sufficient wattage.)

●关于电涌

高亮度LED灯使用了对静电很敏感的元件，电涌等产生的异常电压有时可能会导致不亮灯，敬请注意。

●Surges

High-brightness LED products use elements that are sensitive to static electricity. Keep in mind that an unusual voltage, such as a surge voltage, may cause the product to malfunction.

■其他事项 Others

●操作

请避免叩击操作或弹击操作，否则会损坏按钮。请务必用手操作。自锁类产品，切勿拉拔按钮。

●带灯型的密集安装

连续亮灯的用途，有时会因发热使周围温度上升超过额定值，敬请注意。安装面板为非金属板或在密闭的控制柜内使用时，必须进行通风换气。

●使用场所

- 请在规定的工作环境温度和湿度范围内贮存和使用。
- 虽然对普通使用的切削液和冷却液进行了评估没有问题，但对于特殊的油类应避免接触。
- 如果在按钮和框架的间隙堆积了灰尘和粉状切屑，可能会导致不能正常操作，敬请注意。在这种场所使用时，需要使用防尘罩等保护。AD16系列均适合于室内使用。须避免阳光直射。
- 请勿在受到臭氧、腐蚀性气体影响的场所使用。

●Operation

Do not hit or flip the button, or the button may be damaged. Be sure to operate the button by hand. Do not pull the button if the switch is an alternate action type.

●High-density mounting of illuminated type

When continuously lighting pilot lights or pressing illuminated pushbuttons, keep in mind that the ambient temperature may exceed the rated value due to the heat radiated by the lamp. Be sure to ventilate the lamp /switch if the mounting panel is not made of metal or if the mounting panel is an enclosed type.

●Usage locations

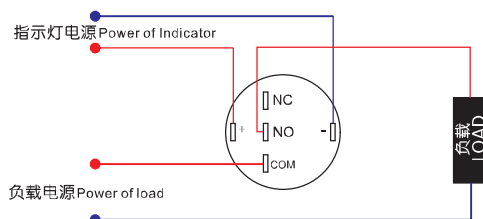
- Be sure to use and store the product within the rated ambient temperature and humidity ranges.
- Although the product resists ordinary cutting oils and coolant oils, do not use the unit in places where special oils may be sprayed onto the product.
- If dusts or filings accumulate in the gap between the button and the frame, the switch may fail to operate normally. Take appropriate measures, such as using a dust-proof protective cover, if the switch is to be used in places that are subject to dusts or filings.
- The AD16 series and AD12,AD10 series are for indoor use. Make sure that the product is not exposed to direct sunlight.
- Do not use the product in the places that are subject to the adverse effects of ozone or corrosive gases.

电路接线方法（示例）Circuit wiring（examples）

●常开线路接线 Normally Open Circuit wiring

实现功能：开关指示灯常亮，开关动作时候负载工作。开关控制单条线路。指示灯电压与负载电压不同。

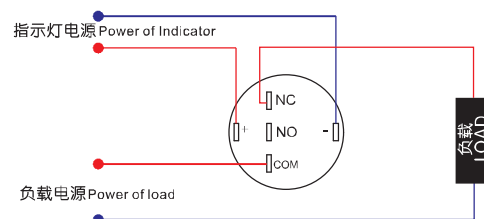
Feature implementation : switch light is always bright, it is operating with load when the switch acted. The switch control the single circuit The voltage of the indicator is different from the load voltage.



●常闭线路接线 Normally Close Circuit wiring

实现功能：开关指示灯常亮，开关动作时候负载停止工作。开关控制单条线路。指示灯电压与负载电压不同。

Feature implementation : switch light is always bright, the load stops when the switch acted. The switch control the single circuit The voltage of the indicator is different from the load voltage.

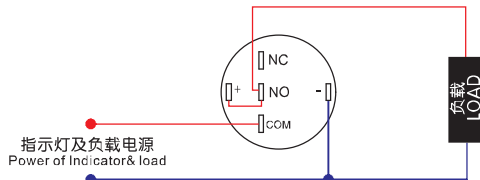




●常开线路接线 Normally Open Circuit wiring

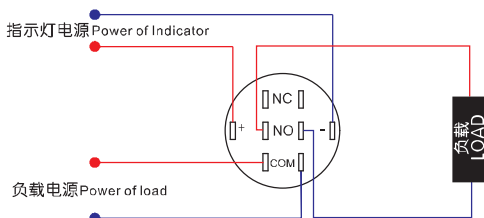
实现功能：开关动作时候负载工作并且指示灯点亮,开关控制单条线路，条件是负载电源和指示灯电源电压相同。

Feature implementation : it is operating with load and the indicator is brighting when the switch acts.The switch control the single circuit, on the condition that the voltage of load and indicator power is the same.



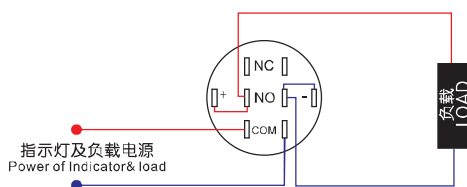
实现功能：开关指示灯常亮，开关动作时候负载工作。开关控制两条线路。指示灯电压与负载电压不同。

Feature implementation : switch light is always bright,it is operating with load when the switch acted. The switch control the two circuit. The voltage of the indicator is different from the load voltage.



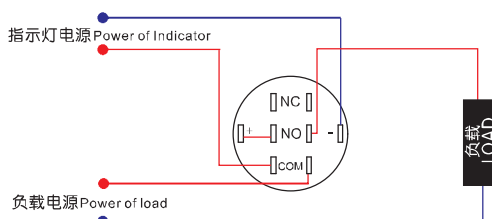
实现功能：开关动作时候负载工作并且指示灯点亮，开关控制两条线路，条件是负载电源和指示灯电源电压相同。

Feature implementation : it is operating with load and the indicator is brighting when the switch acts.The switch control the two circuit, on the condition that the voltage of load and indicator power is the same.



实现功能：开关动作时候负载工作并且开关指示灯点亮。开关控制两条线路。其中一路控制负载电路，一路控制指示灯电路指示灯电压与负载电压不同。

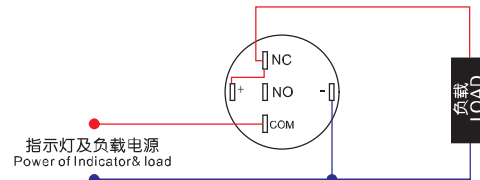
Feature implementation : it is operating with load and the indicator is brighting when the switch acts. The switch control the two circuit ,one controls the load cruit,the other controls the indicator.the voltage of indicator is different from the load's



●常闭线路接线 Normally Close Circuit wiring

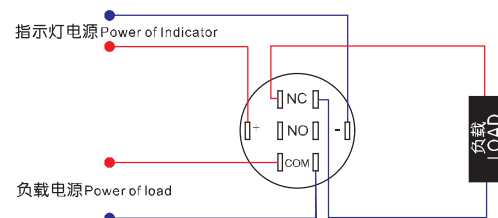
实现功能：开关动作时候负载停止工作并且指示灯灭，开关控制单条线路，条件是负载电源和指示灯电源电压相同。

Feature implementation:The load stops and the indicator turns off when the switch acting.The switch control the single circuit ,on the condition that the voltage of load and indicator power is the same.



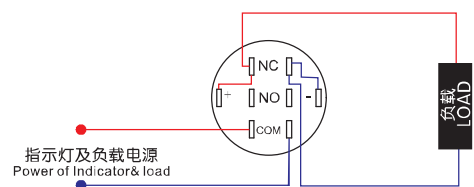
实现功能：开关指示灯常亮，开关动作时候负载停止工作。开关控制两条线路。指示灯电压与负载电压不同。

Feature implementation : switch light is always bright,The load stops and the indicator turns off when the switch acting. The switch control the two circuit . The voltage of the indicator is different from the load voltage.



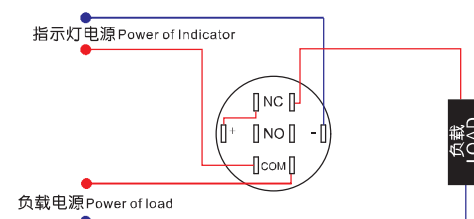
实现功能：开关动作时候负载停止工作并且指示灯灭,开关控制两条线路，条件是负载电源和指示灯电源电压相同。

Feature implementation : The load stops and the indicator turns off when the switch acting.The switch control the two circuit ,on the condition that the voltage of load and indicator power is the same.



实现功能：开关动作时候负载停止工作并且开关指示灯灭。开关控制两条线路。其中一路控制负载电路，一路控制指示灯电路。指示灯电压与负载电压不同。

Feature implementation : The load stops and the indicator turns off when the switch acting.The switch control the two circuit ,one controls the load cruit,the other controls the indicator.the voltage of indicator is different from the load's

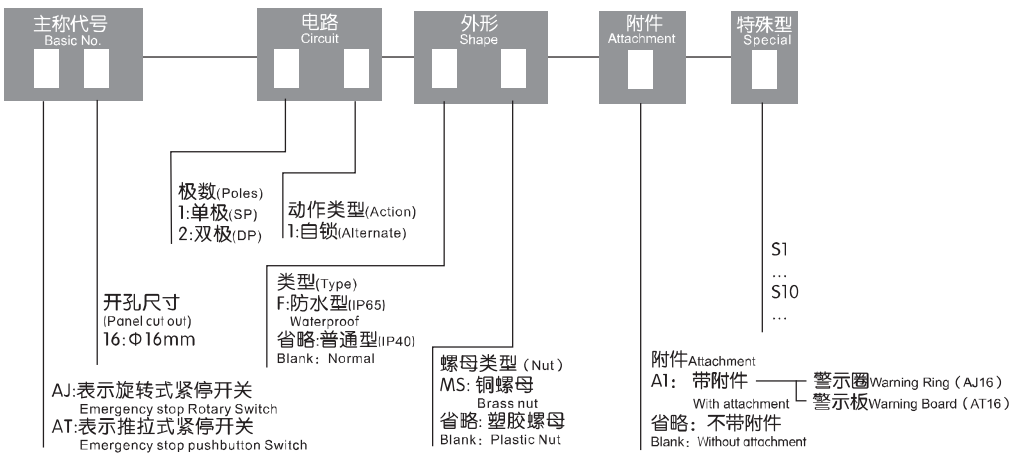




技术性能参数 SPECIFICATION

电气额定值（阻性负载） Max. Rating Current & Voltage(Resistive Load)	3A 250V AC
接触电阻（初始值） Contact Resistance	≤50mΩ
绝缘电阻（常态） Insulation Resistance	≥1,000MΩ
耐压（常态） Dielectric Strength	1,500V
电气寿命（次） Electronic Life(cycles)	自锁:25,000 Alternate:25,000
机械寿命（次） Mechanical Life(cycles)	自锁:50,000 Alternate:50,000
工作环境温度 Operating temperature	-5℃~+75℃
防护等级 IP code	IP44

型号命名规则 HOW TO ORDER



Φ16外形及尺寸图Overall & Dimensions(mm)

